

1.3 - Solving Two-Step Equations

-Require 2 different operations

To Solve: Addition/Subtraction

Multiplication/Division

Simplify if needed/able to

Ex: $5x + 3 = 38$

$$\begin{array}{r} 5x + 3 = 38 \\ -3 \quad -3 \\ \hline 5x = 35 \\ \div 5 \quad \div 5 \\ \hline x = 7 \end{array}$$

$2x - 3 = 1$

$$\begin{array}{r} 2x - 3 = 1 \\ +3 \quad +3 \\ \hline 2x = 4 \\ \div 2 \quad \div 2 \\ \hline x = 2 \end{array}$$

$$2x + 1 = -5$$

$$\frac{2x}{2} = \frac{-6}{2}$$

$$x = -3$$

$$4x + 3 = 7$$

$$\frac{4x}{4} = \frac{4}{4}$$

$$x = 1$$

$$3m - 4 = 11$$

$$\frac{3m}{3} = \frac{15}{3}$$

$$m = 5$$

$$2.5x + 25 = 150$$

$$\frac{2.5x}{2.5} = \frac{125}{2.5}$$

$$x = 50$$

$$x - 9 = 10 \cdot 4$$

$$x - 9 = 40$$
$$\frac{x}{1} = \frac{49}{1}$$
$$x = 49$$

1.4 - Solving Multi Step Equations

- Simplify each side first
- Variables on one side, numbers on the other
- Get the variable by itself

Ex: $-5x + 2 = -3x - 8$

$$\begin{array}{r} +3x \quad +3x \\ \hline -2x + 2 = -8 \\ -2 \quad -2 \\ \hline -2x = -10 \\ \hline x = 5 \end{array}$$

$3a + 2(a - 1) = 7a - 4(a + 2)$

$$\begin{array}{r} 3a + 2a - 2 = 7a - 4a - 8 \\ 5a - 2 = 3a - 8 \\ -3a \quad -3a \\ \hline 2a - 2 = -8 \\ +2 \quad +2 \\ \hline 2a = -6 \\ \hline a = -3 \end{array}$$

$$\begin{array}{r} \cancel{2x} - 2 = 4x + 6 \\ -\cancel{2x} \quad -\cancel{2x} \\ \hline \end{array}$$

$$\begin{array}{r} -2 = 2x + \cancel{6} \\ -6 \\ \hline \end{array}$$

$$\begin{array}{r} -8 = 2x \\ \frac{-8}{2} = \frac{2x}{2} \quad \boxed{x = -4} \end{array}$$

$$\begin{array}{r} \cancel{4x} + 3 = 5x - 4 \\ -\cancel{4x} \quad -\cancel{4x} \\ \hline \end{array}$$

$$\begin{array}{r} 3 = x - \cancel{4} \\ +4 \quad \quad +4 \\ \hline \end{array}$$

$$\boxed{7 = x}$$

$$\begin{array}{r} 3x + 5 = \cancel{2x} + 2 \\ -\cancel{2x} \quad -\cancel{2x} \\ \hline \end{array}$$

$$\begin{array}{r} x + \cancel{5} = \cancel{2} \\ -5 \quad -5 \\ \hline \end{array}$$

$$\boxed{x = -3}$$

$$2x - 5 = 4x - 1$$

Skip

$$16m - 3(4m + 7) = 3m - (12 - m)$$

$$16m - 12m - 21 = 3m - 12 + m$$

$$\begin{array}{r} 4m - 21 = 4m - 12 \\ -4m \qquad -4m \\ \hline \end{array}$$

$$-21 = -12$$

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$$8y - 4 + 3(y + 7) = 6y - 3(y - 3)$$

$$\cancel{8y} - 4 + \cancel{3y} + 21 = \cancel{6y} - \cancel{3y} + 9$$

$$\cancel{11y} + 17 = 3y + 9$$

$$\begin{array}{r} 17 = -8y + 9 \\ -9 \qquad -9 \\ \hline \end{array}$$

~~8y = 11y~~
~~11y = 8y~~
 $11 = 8$

